

Abstract

Although it is recognized that the diversity influences the knowledge sharing between employees, there is very little empirical research on the relationship between language diversity and knowledge sharing in the organizations. In this context, this study adopts the network perspective and explores the linguistic composition of personal knowledge networks, its causes and consequences. A survey was conducted involving 403 participants in different subsidiaries of a multinational organization. Hierarchical regression analysis and ANOVA were performed to test the hypotheses. Regression analysis showed that the language diversity in the immediate department and employees' linguistic association in the organization significantly affects the language diversity in employees' personal networks. However, against expectations, language attitude did not have any effect. Moreover, ANOVA results show that the employees with multilingual knowledge-sharing networks perform better than those with monolingual knowledge-sharing networks in the organization even though their knowledge-sharing behavior is the same.

Keywords: knowledge sharing, knowledge networks, language diversity, multilingual organizations

Introduction

Knowledge sharing is the integral part of organizational life. Organizational employees continuously engage with their colleagues to acquire new insights and to find the innovative solutions to their complex problems (Ghaznavi, Perry, Logan & Toulson, 2011). Knowledge created and acquired through the cooperation and discussion with the colleagues enhances employees' productive capacity, which ultimately reflects in the organizational performance. For the speedy acquisition of knowledge, employees often rely on their personal knowledge-sharing networks (Ghaznavi et al. 2011) herein called knowledge networks. Knowledge networks develop both intentionally out of the need to acquire knowledge from other skilled employees and spontaneously due to the daily conversations, small talk and social gatherings in the workplace. Such spontaneously developed networks also tend to act as personal knowledge networks due to the existing trust and friendship prevalent in the relationships (Kilduff & Tsai, 2003). According to Krackhardt and Hanson (1993), it is this knowledge network of the organizational employees where most of the daily work is done in the organizations. Such networks provide the basic structure for knowledge diffusion and implementation at the individual level (Conway, 2002, Verburg & Andriessen, 2011).

Recently organizations have experienced an ever-more multilingual workforce. Cross-border business commitments and movement of people have rendered many organizations linguistically and culturally diverse (Ahmad & Widén, 2015). An ever-increasing number of organizations are adopting English as their corporate language and are hiring multilingual employees (Peltokorpi & Vaara, 2014). According to the previous research, language diversity in the organizations leads to the development of the homophilous networks aligned with linguistic boundaries (Tange & Luring, 2009). Since personal knowledge networks are subsets of larger organizational knowledge network, the presence of a low level of language diversity in knowledge networks leads to fragmentation in organizational knowledge networks. As a result knowledge and information is contained within linguistic clusters, whereas little knowledge is transmitted across linguistic boundaries within the organization (Ahmad & Widén, 2015; Tange & Luring, 2009). Moreover cross-fertilization of ideas across different language groups suffers, and the benefits of the linguistic diversity that

usually coincides with the cognitive diversity are not reaped in the organization. What influences language diversity in knowledge networks is not well known. A few case studies have underlined the importance of language (proficiency) for knowledge sharing among multilingual employees. Nonetheless, no empirical study has undertaken an in-depth analysis of language diversity in knowledge networks, its causes and consequences. In this paper, we investigate the influence of various extra-linguistic factors on language diversity in knowledge networks. More specifically, we look at the relationship between language diversity in the department, linguistic association, attitude toward the corporate-language and language diversity in knowledge networks.

The disadvantages of the language diversity in networks at the organizational level are often discussed, but the consequences of language diversity in networks at the individual level have not been investigated. Therefore, in this paper it is also studied how employees with highly multilingual knowledge networks differ from those with low or no language diversity in their knowledge networks in terms of knowledge sharing behavior and performance.

The study is important for several reasons. Knowledge networks provide the basic mechanism for knowledge sharing, and their composition strongly influences the knowledge flows in the organization (Kilduff & Tsai, 2003; Phelps, Heidl & Wadhwa, 2012). The composition of knowledge networks in terms of linguistic diversity is a relatively under-researched area; this study provides useful insights into the causes and consequences of language diversity in knowledge networks. Second, multilingualism in organizations is likely to grow, as will the complexity of the knowledge networks. By developing the link between language and knowledge networks of organizational employees, the research can be helpful in the management of knowledge in multilingual organizations. Third, while some studies have mentioned the influence of language diversity on knowledge networks of employees in theoretical terms (e.g. Ahmad & Widén, 2015; Welch & Welch, 2008), this study goes one step further and analyzes the language diversity in knowledge networks by using the network analysis technique.

Knowledge networks

The knowledge network of an individual refers to a set of nodes (individuals) who are important sources of knowledge acquisition and creation (Phelps et al., 2012; Ibara, 1992). The role of knowledge networks in knowledge management is crucial and, for many years, the knowledge-management literature has espoused the virtues of the knowledge networks (Beesley, 2004; Hansen, 1999; Davenport & Hall, 2002). Such networks are important devices for informal knowledge sharing at the individual level, and by providing the basic structure for information flow they also add considerable value to the formal knowledge-management efforts of an organization (Mariotti, 2012, Nirmala & Vemuri, 2009). Knowledge networks are not merely about transferring information from one person to another; these structures of connection also provide the opportunity for collective learning and knowledge creation. This can help “identify or reformulate problems, validate ideas and a course of action, offer critical perspective, discover opportunities, and allow problems to be better divided up through the division of labor” (Fliaster & Spiess, 2008:100). The previous literature suggests that it is important to develop a deep understanding of the different aspects of knowledge networks because these networks influence the “efficacy and efficiency by which individuals and collectives create knowledge by affecting their ability to access, transfer, absorb, and apply knowledge” (Phelps et al., 2012:3).

Individuals are the nuts and bolts of a knowledge network. Knowledge networks are usually regarded as natural devices for knowledge sharing (Conway, 2002) but how good these devices are depends greatly on what different individuals have to offer (Widen & Hansen, 2012). In this context, diversity in networks has caught the eye of researchers, and various aspects of diversity have been studied in networks in organizations. In the organizational context, some of the earliest works studied the natural aspects of the diversity such as ethnicity (Ibarra, 1995) and gender (Helgesen, 1990). With the rise of globalization and information technology, new forms of diversity such as cultural diversity and geographical diversity (virtual and physical) (Reagans & Zuckerman, 2001; Owen-Smith & Powel, 2004) of the network connections have also been found to have consequences for knowledge networks. Whether diversity in its different forms is good for organizational- and individual-level performance is still subject to debate (Harrison & Klein, 2007). There are some controversial findings in this regard (Ely & Thomas, 2001). Regardless of the advantages or disadvantages of the diversity in knowledge networks, what is mutually agreed is that diversity in knowledge networks influences the way individuals work as well as the functioning of the organization in general (Reagans, 2001). Therefore investigating the diversity of knowledge networks has been important, although the analysis of language diversity in knowledge networks still lacks any empirical enquiry.

Language diversity in knowledge networks

According to Tange and Luring (2009), language diversity in the workplace may influence knowledge sharing in the organization because of its moderating effect on the composition of knowledge networks of individuals. Particularly, knowledge of the common corporate language plays an important role in creating multi- or monolingual knowledge networks. Lack of corporate language skills results in the avoidance of interaction between non-native speakers. Employees are less likely to get into situations where their deficiency in the corporate language is exposed (Park, Hwang & Harrison, 1996). Therefore, they may end up communicating mostly in their native language with the people from a similar linguistic background, resulting in connection between linguistically homophilous nodes. This is in accordance with network theory, which underlines communication as a condition for the development of a connection between two people; if there is no communication there is a no connection (Kadushin, 2012).

There is no doubt that the language proficiency is an important linguistic factor when it comes to explaining language diversity in knowledge networks of organizational employees. Nonetheless, it may not be the only factor. There are many other factors that influence the language behavior of the individual, that is, who talks with whom (Edwards, 2009), and consequently network development. Such factors are usually called extra-linguistic factors (Kim & Lee, 2010). These factors are not concerned with the natural aspects of language such as grammar, sentence construction, word order but rather are mostly the context-related and social aspects of the language that have direct consequences for the language behavior (Schüppert & Gooskens, 2012). Language proficiency is a linguistic factor since it entails knowledge of the natural language. In this study, three extra-linguistic factors are included: language diversity in the department, language attitude, linguistic association, and their relationship with language diversity in knowledge networks is analyzed. These three extra-linguistic factors were selected because they correspond to the three important antecedents of network development. Language diversity in the department corresponds to the proximity principle, that is, the closer the potential contact, the more likely the connection will occur. Linguistic association corresponds to the social-exchange principle, that is, the more valuable

the individual, the more likely he/she is to be approached for connection by others. Language attitude corresponds to the attraction principle, that is, the more the person likes the other person in terms of his characteristics, the more likely she will try to develop the connection. Hypotheses are developed in the following discussion.

Language diversity in a department

The existence of language diversity in organization does not mean that it is distributed equally across the organization. Some departments may have many more employees with linguistically diverse background than others. Many factors, such as the function of the department, the proximity of the department in the organization, its communication channels and external exposure both inside the organization to other units and outside the organization to clients and partners, may influence the level of language diversity in the department. Also recruitment criteria add to variance in language diversity in different departments. The language demands vary from job to job even in highly multilingual organizations. Many multinational organizations often advertise their job positions with different language requirements. For some jobs, high proficiency in the corporate language is required, while for others knowledge of some other language, usually the local language, is more valued. Due to all these factors, organizations may have diversity in their units or departments ranging from very high to none at all (Criscuolo, 2010). This is relevant for language diversity in knowledge networks, because belonging to the same department means closer cognitive, spatial or even virtual proximity among employees. Proximity, particularly spatial proximity, is known to influence network formation and development (Cronin, 2008). One of the earliest and most influential studies was by Allen (1984), who investigated the spatial distance between members of an R&D team. He found the greater the distance between desks, the less likely there would be communication and interaction between people and therefore the less chances of network connection between these people. Employees in a department usually work together and hence connect with each other in their knowledge networks. Even if they do not have any direct cooperation or work together, they are still more likely to be visible to each other, interact with each other and bump into each other during departmental meetings or coffee breaks. Such encounters play an important role in the development of knowledge networks (Tange & Luring, 2009). Based on the discussion so far, we can assume that language diversity in a department has consequences for language diversity in knowledge networks. Hence the following hypothesis is proposed.

H1. The language diversity in the department has a positive effect on the language diversity of the knowledge network.

Language attitude

Language attitude refers to the feelings, thoughts and predispositions toward language, one's own and those of others (Garett, 2010). As Tamasi and Antieau (2015:45) write, everyone has language attitudes, and they may be different in different domains of society, such as family, friends, and workplace. These attitudes are influenced by a number of factors such as education, interactions in society, and exposure to groups speaking different languages. Language attitude is important in defining when, why, and how a language is used and how people approach speakers of other languages (Bradac, 1990). It triggers emotional responses toward the use of a language (Ahmad & Widén, 2015). Negative attitudes toward a language entail less interaction in that language or complete avoidance of that language and sometimes its speakers as well (Jenkins, 2007). Similarly a positive attitude toward language means that people are more likely to use that language and interact with the people who speak that language rather comfortably (Giles & Coupland, 1991). This is what makes language attitude relevant to knowledge sharing in organizations.

A multilingual or multinational organization usually has many language groups in its workforce. In order to insure smooth communication between these language groups, such organizations usually adopt a common corporate language or official language. However, this one-language policy is not equally appreciated by all employees as it may give more authority and control to some than to others (Brannen, Piekkari & Tietze, 2014; Welch & Welch, 2008). Therefore, organizational employees may develop positive or negative attitudes toward this common corporate language. For example, a study by Tange and Luring (2009) showed that organizational employees who were relatively less proficient in the common corporate language resented the use of the corporate language. Such resentment grows further when organizations implicitly value employees' language skills more than their professional skills (Neeley, 2012). However, it is not always proficiency levels that trigger negative attitudes. Sometimes emotional feelings attached to the corporate language may also result in resentment and negative attitudes toward that language in the organization (Neeley et al., 2012). For example, when Nordbanken from Sweden merged with Merita bank from Finland, the new Meritanordbanken decided to use Swedish as the common corporate language because most of the Finns are bilingual in Swedish and Finnish. Many Finnish employees reacted strongly against the use of Swedish, as it reminded them of the colonial era when the Finnish language was strongly subordinated to Swedish (Vaara et al., 2005). During those times, Finns were forced to adopt Swedish and forget the Finnish language. The importance of employees' language attitudes and their potential to influence the day-to-day communication in the organization is visible in many organizations that adopt ambiguous language policies, such as Siemens, where both German and English are used officially (Fredriksson et al., 2006). In short, organizational employees have different views and feelings toward the corporate language (Neeley, 2012), which consequently may influence their intention to use and their openness to using that language (Tamasi, 2015). If a positive language attitude means more use of that language and more interaction with the speakers of that language, then we can say that people who have a positive attitude toward the corporate language are more likely to use that language in the organization and hence have greater chances of interaction with the people around the organization who have diverse linguistic backgrounds. As a result, they are more likely to have multilingual knowledge networks. Hence it is proposed that:

H2. Positive language attitudes toward the corporate language have a positive effect on language diversity in the knowledge network.

Linguistic association

A multilingual organization usually has different languages that have varying status in the organization (Ahmad & Widén, 2015). According to Thomas (2008), there are three important languages in any multilingual organization; the parent company language, the common corporate language and the local subsidiary language. Usually the parent company language enjoys the highest status in the organization after the common corporate language. It even sometimes precedes the corporate language in importance, because knowledge of the parent company language may allow the access to valuable information and resources in the organization (Ahmad & Widén, 2015). This could be because of ethnocentric recruitment policies in the organization. Such policies result in a high proportion of employees, particularly in management, from the parent country of the organization (Van den Born & Peltokorpi, 2010). As a language of management, the parent company language takes the highest position in the linguistic hierarchy. Skills in this language can sometimes provide access to the confidential information that is beyond the formal status of an employee in the organization (Du-Babcock & Babcock, 1996). According to a study by Piekkari et al. (1999),

Finnish -speaking employees enjoyed the highest status in a Finnish multinational because their Finnish language skills allowed them the access to the employees at headquarters, where most of the important decisions were made and where highly valuable information and knowledge resided. The Finnish-speaking cluster found itself connected with the core of the organization and found information access an easy task. Also, a study by Luring and Bjerregaard (2007) showed that Danish was very important language in a subsidiary of a Danish organization in Saudi Arabia, because most of its top management in that subsidiary was composed of expatriates from Denmark. As a result, the parent company language was even more important than English, because Danes tended to converse in Danish whenever possible and used it as a tool to buffer the information from others. As exchange theory tells us that employees make connection in their knowledge networks with those who are valuable knowledge sources (Wu, Lin, & Lin, 2006), it can be claimed that linguistic association may influence language diversity in a knowledge network. Employees with proficiency in the parent company language may be more tempted to develop their contacts with those who speak the parent company language than with others. There are fewer rewards for them to connect with others, because they will be more on the sending than the receiving end of knowledge communication. Moreover, if the cluster of the parent-company language speaker already enjoys better access to knowledge resources, it is less likely that parent-company language speakers would forgo their superior position by developing the links with the outsiders. Based on the discussion the following hypothesis is proposed.

H3. Linguistic association is associated with language diversity in knowledge networks and the parent-company language speakers (the ones who are highly proficient) are less likely to have language diversity in their knowledge network than speakers of other languages.

Multilingual versus monolingual knowledge networks

A multilingual knowledge network is defined as a network composed of people with different linguistic backgrounds, whereas a monolingual knowledge network is defined as a network composed of people with similar linguistic backgrounds. How do employees with a high level of language diversity in their knowledge networks differ from those with very low or no language diversity at all? This question has not been addressed empirically, even though its importance is apparent in discussions on knowledge sharing in multilingual organizations (e.g. Ahmad & Widén, 2015; Sunaoshi et al. 2005; Schomaker and Zaheer, 2014). Some previous studies have underlined the importance of language diversity in networks for knowledge sharing at the larger level such as the departmental and subsidiary level (Makela et al., 2007). Such studies anticipated the consequences of language diversity in knowledge networks at the organizational level. It is proposed that the ideal situation demands strong informal knowledge sharing across the organization regardless of linguistic boundaries (Welch & Welch, 2008). This is how an organization will be able not only to operate at its maximum capacity but to use its diversity as a resource. Nonetheless, what difference the language diversity in knowledge networks makes for individual employees, particularly in terms of their knowledge sharing behavior and performance, has received only theoretical treatment so far (Ahmad & Widén, 2015).

Based on the diversity literature, we propose that employees with multilingual knowledge networks are likely to have positive knowledge-sharing behavior. Knowledge-sharing behavior means “the degree to which organizational members actually share knowledge with others” (Yang & Chen, 2003, p.101). People with different linguistic backgrounds usually have links to various knowledge and information resources that extend beyond language boundaries. Individuals in the network may be tempted to ask for information from others to

get diverse information from extended sources that are beyond their immediate access. As a result, people with multilingual knowledge networks are likely to have positive knowledge-sharing behavior because of their high level of engagement with their peers in the network. Hence the following hypothesis is proposed.

H4. Employees with multilingual knowledge networks are likely to have more positive knowledge-sharing behavior than those with monolingual knowledge networks.

As language diversity brings with it cultural and cognitive diversity, employees with multilingual knowledge networks would have access to a diverse set of approaches to problems solving and task accomplishment (Ely & Thomas, 2001). This should result in high-quality decisions and ultimately improved performance. Hence the following hypothesis is proposed.

H5. Employees with multilingual knowledge networks are likely to perform better than those with monolingual knowledge networks.

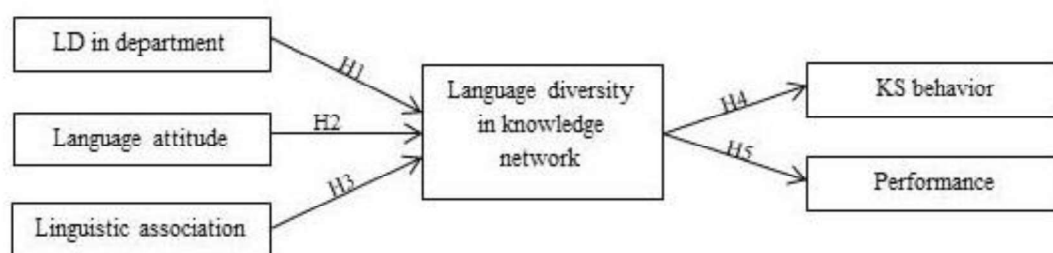


Fig. 1 Research model.

Research Methodology

Sample and data collection

The sample of this study consisted of managerial and professional employees working in different subsidiaries of a large Finnish multinational organization. The organization develops power solutions ranging from ship machinery and propulsion to power plants for marine and energy markets. The employees who participated in the survey were of different nationalities and linguistic backgrounds and all were able to speak English. These employees belonged to different common functional areas such as marketing, human resources, R&D, sales, communication, engineering, and strategy development.

The data was collected via an electronic questionnaire. The questionnaire consisted of different variables, and a 7-point Likert scale was used to measure the independent variables. The respondents were asked to indicate the degree to which they agree or disagree with the statements. The questionnaire was administered through the organization's internal online survey system. The link to the survey was advertised on the company's intranet. Moreover, the communication department took the responsibility to encourage and inform the employees around the organization to fill in the questionnaire. In total 402 responses to the questionnaire

were received. Around 65% of the respondents were males and 35% were females and 32 languages were represented.

Instrument

Dependent and independent variables

Language diversity in knowledge networks of employees was assessed by using the ego-centric question technique (Hlebec & Kogovšek, 2013). This technique is used to get the names of persons (connection) in a personal network of a person as well as to get the information about the people in the network. First, each respondent was asked to name the people in the organization who are important sources of professional advice, whom he/she often approaches for help when there is a work-related problem or when advice on a decision is needed (Ibara, 1992). Respondents were asked to use a pseudonym for anonymity reasons. In the next step, the respondent was asked to indicate whether or not the individuals being mentioned as network connections have the same native language as he/she. Based on these two questions, the percentage of language diversity in the knowledge network was calculated.

Language attitude was assessed using a 7-item scale adopted from Lai (2012). A sample item is: "The use of English (corporate language) in the organization is one of the crucial factors which have contributed positively to the success of the organization" (*Cronbach's alpha* = 0.73).

Language diversity in the department was measured by a direct question: "to your knowledge, how large a proportion of the people in your department has a native language different from yours?"

Linguistic association was measured using native language association. A direct question was asked: what is your native language? Linguistic association is a categorical dummy variable where employees whose native language is the parent company language are coded as 0 and the rest as 1. Moreover, the respondents who had a working knowledge of the parent company language were also coded as 0, and this was found out by asking a direct question whether or not the respondent uses parent company language for interaction at work.

To find whether an employee's knowledge network is multilingual or monolingual, a categorical variable named linguistic type of knowledge network was created. Employees with linguistically diverse people in their knowledge network were characterized as having multilingual knowledge networks and the rest as monolingual. This variable was used as independent variable in ANOVA.

Knowledge-sharing behavior was measured using a 5-item scale adapted from Yang and Chen (2007). A sample item is: "I share my experience or know-how from work with other organizational members" (*Cronbach's alpha* = 0.78).

The construct of performance was measured using self-rated evaluation of success at work (Lauring & Selmer, 2011; Rodwell, Kienzle & Shadur, 1998). For this purpose a 7-item scale was adapted from Huvila (2010) and Peluchette and Jeanquart (2000). A sample item is: "I am successful at work as has been shown in the feedback from my superiors" (*Cronbach's alpha* = 0.81).

Control variables

English was the corporate language of the organization. Any respondent who could not speak English at all was not included, although competency in English may vary from person to

person and may influence the language diversity of the knowledge network. So English-language proficiency was included as a control variable. Age was also included as a control variable as it is usually accepted that the younger generation is more open to diversity. Length of tenure may also influence the language diversity of a knowledge network because the longer the time spent in the organization, the more likely it is that the person will get connected with someone from a linguistically diverse background. Therefore, length of tenure was included as a control variable. All the control variables were measured using a direct question.

Results

Sample means, standard deviations and zero-based correlations are provided in Table 1. To test the relationship of language diversity (LD) in the department (H1), language attitude (H2), linguistic association (H3) with the language diversity of the knowledge network (LD of KN), we used regression analysis; the results are shown in Table 2. In the step one, all the control variables were entered. As expected, English proficiency is significantly associated with the language diversity of the knowledge network, hence confirming propositions in previous studies that language proficiency is an important factor in explaining the language diversity of knowledge networks (e.g. Welch & Welch, 2008). In the second step, all the independent variables were entered. Language diversity in the department is significantly associated with the language diversity of knowledge networks (beta=0.46: $p<0.001$), confirming first hypothesis. There was no significant relationship between corporate language attitude and the language diversity of knowledge networks (beta=0: $p>0.05$), thus rejecting second hypothesis. Linguistic association is also significantly associated with the language diversity of knowledge networks (beta=0.39: $p<0.001$), the plus value of the beta coefficient indicating that non-parent-company-language speakers have more language diversity in their knowledge network than parent-company-language speakers, confirming third hypothesis.

Table 1. Means, standard deviations, and correlations among the variables

Variables	Mean	SD	1	2	3	4	5	6	7	8
LD in KN	46.11	33.87	1							
Age	2.38	1.00	.01	1						
Hierarchy	2.45	0.69	.10	.01	1					
Length of tenure	9.27	7.58	-.04	-.06	0.23**	1				
English proficiency	4.62	0.90	.21**	.04	.18**	-.01	1			
LD in department	3.74	1.84	.46**	-.067	.09	.03	.19**	1		
Language attitude	40.31	6.76	-.05	-.12*	.01	.01	.08	-.10	1	
Linguistic association	0.56	0.50	.36**	.09	.04	-.08	-.04	-.06	-.04	1
Notes: * $p<0.05$; ** $p<.01$ (two-tailed)										

Table 2. Results of regression analysis for language diversity of knowledge networks

<i>Step 1 (control)</i>	LD of KN
Age	0.01
Hierarchy	0.06
Length of tenure	-0.03
English proficiency	0.20**
R	0.22
R ² adjusted	0.03
F	2.68
<i>Step2</i>	
LD in department	0.46***
Language attitude	0.00
Linguistic association	0.39***
R	0.62
R ²	0.38
R ² adjusted	0.36
F	18.06***
Notes: * p<0.05; **p<.01; ***p<.001 (two-tailed)	
Regression coefficients are standardized.	

To test the difference in knowledge-sharing behavior and performance between employees with multilingual or monolingual knowledge networks, one-way ANOVA F-test was used. This method is useful to test whether there is any difference between two or more groups against a certain set of variables (Ek, 2015). The results in Table 3 show that knowledge-sharing behavior is not significantly associated with the two types of the knowledge networks, and there is also no difference between the mean value of the knowledge-sharing behavior of employees with multilingual and monolingual knowledge networks. As a result, fourth hypothesis is rejected. However, there is a statistically significant relationship between performance and two types of knowledge network. The mean value of the performance reported by employees with multilingual knowledge networks is higher than the employees with monolingual knowledge network, showing that employees with multilingual knowledge network perform better than those with monolingual knowledge networks. This supports hypothesis five.

Table 3. Results from one-way ANOVA showing differences between employees with monolingual and multilingual knowledge networks

	Monolingual KN	Multilingual KN	F-value
Knowledge-sharing behavior (n=265)	28.15 (4.99)	28.85 (4.91)	1.21
Performance (n=237)	38.06 (6.94)	40.00 (5.65)	5.14*
Notes: * p<0.05			
n=number			
Cells provide means and standard deviations.			

Discussion

The objective of this study was to investigate the influence of various extra-linguistic factors on language diversity in knowledge networks and to explore the knowledge sharing behavior

and performance consequences of having a multilingual or monolingual knowledge network at the individual level. Some interesting propositions are manifested.

Language diversity in a knowledge network is usually explained in terms of language proficiency in the common corporate language. This proposition has been mentioned in some previous studies but had not been tested empirically until now. This study supports this proposition, although language proficiency was included as a control variable. An important output of this study is that language proficiency is not the only influential factor; other extra-linguistic factors may also play an important role in creating language diversity in the knowledge network. It was found that the language diversity of the department has a strong influence on language diversity in the knowledge networks of the employees. This finding can be explained by the proximity principle that underlines the idea that the formation of the immediate environment in an organization has consequences for the formation of knowledge networks. Although the definition of immediate environment has become more contingent on the phenomena of teams (Suh & Shin, 2010), departmental affiliations are still critical for socialization in the organization, particularly for development of language diversity in knowledge networks. Interestingly corporate language attitude did not have any relationship with the language diversity of the knowledge network. It raises the question of whether personal feelings towards the corporate language matter in the organizational context. Some previous studies have underlined how employees may develop negative emotions toward the corporate language, potentially entailing a negative influence on an organization's workplace atmosphere and unity (Neeley et al., 2012). But when it comes to knowledge sharing, it may not matter after all. It is probably because there is an economic value in knowledge and the networks are mechanisms to acquire such knowledge. Having access to valuable knowledge can actually enhance one's own worth and performance (Fliaster & Spiess, 2008; Hall, 2002). Therefore employees may put aside their language-related feelings while developing connections in their knowledge network.

Hypothesis 5, that a positive relationship exists between linguistic association and the language diversity of knowledge networks, and that non-parent-company-language speakers will have more language diversity in their knowledge networks as compared to parent-company-language speakers was strongly supported. This is in accordance with previous studies that propose that linguistic hierarchy matters in multilingual organizations (e.g. Brannen, Piekkari & Tietze, 2014). Linguistic hierarchy means language communities differ in terms of power that is quite often based on access to information and knowledge (Van den Born & Peltokorpi, 2010). In terms of diversity in knowledge networks, it means individuals belonging to a language community that enjoys power are likely to connect between themselves even though they are able to speak the common corporate language. They are less likely to go outside of their language group because they see more knowledge value within the group than outside it.

Finally, ANOVA results show that employees who have multilingual knowledge networks do not differ in their knowledge-sharing behavior, but they do perform better than employees with monolingual knowledge networks. The similarity of knowledge-sharing behavior in two groups may be because diversity in knowledge networks, though important in defining the knowledge patterns or direction, may not be relevant in explaining the degree to which knowledge is being shared in the network. The basic function of every knowledge network is to exchange knowledge regardless of its composition, and therefore linguistic composition may not be so important either. However, for performance it may matter, because, as mentioned earlier, the presence and availability of diverse insights may actually help produce better decision making and problem solving. This aligns well with the findings of studies that

propose that diversity of all kinds brings positive effects in work performance (Ely & Thomas, 2001).

Implications and future research

Knowledge networks of employees in the organizations have strong consequences for knowledge flows across the organization (Phelps et al., 2012). The development of comprehensive knowledge-management policies requires a basic understanding of the current dynamics of knowledge sharing in the organization. Organizations with language diversity face the threat of disconnection between language groups, which may not represent an ideal situation for knowledge sharing and innovation (Ahmad & Widén, 2015). To deal with such issues, a deep understanding of the variance in language diversity in knowledge networks at the individual level is required. In this regard, extra-linguistic factors studied in this study enhance our understanding of the development of language diversity in knowledge networks. It is important to move beyond language proficiency as the predictor of knowledge network development in multilingual organizations. There are many other factors that can be helpful in explaining the linguistic formation of the knowledge networks, as shown in this study. However, the variance explained by independent factors in this study is around 36 (R^2) percent, which means there is still a considerable amount of variance that needs to be explained. There are potentially more factors that influence language diversity in knowledge networks and further analysis is warranted. Multiple predictors of diversity in knowledge networks resonate well in network theory, which also proposes that the development of any type of network is subject to various personal and contextual factors.

The ultimate purpose of research is to understand causes and consequences of a phenomenon so that better policies and procedures can be developed. This study tries to cover both of these aspects by analyzing not only what influences the diversity of knowledge networks but also what consequences it has for individuals. As mentioned earlier, much of the previous discussion has taken the analysis of language and knowledge sharing in terms of its consequences at the organizational level. For example, Piekkari, Welch and Welch (1999) have explained how diversity can create clusters (large-level networks) of language at the subsidiary level. Similarly Ahmad & Widén (2015) discuss the formation of language groups and its effect on organizational segregation and knowledge management. It is equally important to understand the consequences of language diversity in knowledge networks for individuals, because they are the basic unit of any organization, and all the policies in the organization are meant to influence individual-level behavior, hoping for the positive aggregate effect of this behavior for the organization at the larger level. The consequences were studied in the form of knowledge-sharing behavior and performance, but further research is needed. One interesting area of research would be deep network analysis of both types of knowledge networks in term of characteristics of the networks, such as the size of the knowledge network, type of interaction and medium used for knowledge sharing, possibility of structural holes, density, etc., and characteristics of relations such as strength of ties and direction of knowledge. Understanding these consequences for the individuals would be helpful in motivating employees to follow the right direction by showing them how the formation of their knowledge network can influence their personal competitive advantage in the organization.

An important theme to look for is the experiences of knowledge sharing within these networks. In this study, it was analyzed whether there is any difference between two groups in their knowledge-sharing behavior, but this does not tell us anything about the positive or negative knowledge-sharing experiences faced by the individuals having multi- or

monolingual knowledge networks. For example, monolingual networks may have very smooth knowledge sharing due to similar native language and possibly culture as well. Makela et al. (2007) propose that similarity in contacts sometimes means speedy knowledge transfer and diffusion. There are fewer cognitive hurdles between the individuals, and they may refer to similar contextualizing cues using their native language (Ahmad & Widén, 2015). However, multilingual networks may have to deal not only with different cognitive styles of thinking but also with different ways of speaking, such as accents and communication styles (Brannen, Piekkari & Tietze, 2014). How these differences influence the experience of knowledge sharing and what consequences they have in the long run for personal knowledge management requires further research.

Any knowledge-management strategy developed by the organization should approach personal knowledge networks as an input and output (Chatti, 2012). On the one hand, existing situation of employees' knowledge networks should provide insights into the development of new knowledge management initiatives and, on the other hand, such newly developed initiatives should aim to solve the problems and discrepancies prevalent in employees' knowledge networks. Such an adjustment in the knowledge management would require close attention to factors that influence knowledge networks at the individual level. For the language diversity of knowledge networks, it means organizations should pay the attention to the diversity level in smaller units, such as departments and even teams. Units that have low or no diversity at all should be exposed to more linguistically diverse colleagues through meetings and interdepartmental projects, to support multilingual knowledge networks at the individual level and to counter any possible linguistic isolation in the knowledge network at the organizational level. Moreover, employees should be made aware of the benefits of having connections with people from linguistically diverse backgrounds that range from diverse sources of knowledge and information to higher performance.

Limitations

There are a few limitations to this study. First of all, the sample was collected from a single organization. Although different subsidiaries, functions and language speakers were involved, it is possible that there could be some language dynamics specific to this organization only, which may make the findings less applicable to other organizations. Some organizations may have an elevated level of language-related problems due to certain recent internal events such as mergers, changes in the language policy, as in the case of Meritanordbanken. As a result employees may respond differently to the questions asked about language in the survey. For example, if there is a conflict in terms of the language policies of the organization, language attitude may emerge as a very important and relevant variable in network development. Based on the discussion with the employees in the organization and study of the recent history of the organization, It can be said that the organization included in this study has not recently experienced any critical language-related events or issues.

Another problem is the reliability of the information provided by the individuals about their contacts. This problem is actually connected with the ego-centric questionnaire technique (Straits, 2000). Nonetheless, it is less likely that there will be problems in this technique when used for measuring knowledge networks, because contacts in knowledge networks are usually important and are used quite often in the workplace, so employees are more likely to remember their contacts and report their characteristics accurately. Greater reliability can be achieved by collecting whole-network data and then extracting individual-level network data from the whole network. However, this technique has some concerns of its own, the greatest one involving anonymity. Whole-network data requires the real names of the contacts (Ibarra,

1992), and employees may hesitate to provide the real names of contacts in their knowledge networks.

This investigation used a cross-sectional research design that offers only limited opportunities of knowledge-network analysis. Networks evolve continuously and change over time. Therefore a longitudinal research design may provide more useful information on the evolution and development of language diversity in the knowledge networks of employees as well as its consequences. As our understanding of the language diversity of knowledge networks is quite limited, the use of a cross-sectional research design is still a viable strategy, at least to enhance our basic knowledge of language diversity in knowledge networks. For a deeper and more sophisticated analysis, longitudinal research would be required in the future.

Conclusion

Understanding employees' personal knowledge networks is extremely helpful in building effective knowledge-management strategies in the organization (Chatti, 2012; Fliaster & Spiess, 2008). One of the most important ways to understand the personal knowledge-sharing network is to look at the composition of such networks (e.g. Hansen et al., 2005; Henttonen et al., 2013; Suh & Shin, 2010). In this paper, quantitative analysis of the linguistic composition of knowledge networks of employees was performed. It was found that extra-linguistic factors enhance the language diversity of personal knowledge networks and that diversity in the knowledge networks also influences employees' performance. This study provides a micro-level understanding of the dynamic relationship of language and knowledge sharing in multilingual organizations by looking at knowledge networks at the individual level rather than the organizational level. In consequence, it not only complements but also adds new insights into previous studies focusing on knowledge sharing in organizations with a linguistically diverse workforce.

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